REPORT ON ENVIRONMENTAL IMPACT OF JAVYS, A.S., OPERATION FOR THE YEAR 2017

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01 INTRODUCTION

Report on the environment for the year 2017 provides comprehensive information on air protection, water and waste management, prevention of major industrial accidents, treatment of chemicals, procedures for the Environmental Impact Assessment (EIA) and activities related to environmental protection performed in JAVYS, a. s.

Maintaining the certified environmental management system of JAVYS, a. s., in accordance with the standard ISO 14001:2015 Environmental Management Systems, the goal and mission to perform all activities with regard to environmental protection have been demonstrated.

At performance of all the activities, the emphasis has been put on compliance with legal requirements identified based on the legislation of SR and EU in individual areas of environmental protection, as well as on the obligation to comply with the limits and conditions of the decisions made by the national authorities and the supervisory bodies for protection of individual environmental elements.

Environmental protection, within the framework of an integrated management system, falls into the process of safety.

02 AIR PROTECTION

In the field of air protection, JAVYS, a. s. complies with the basic legal regulation, i.e. the Act of the National Council of the Slovak Republic No. 137/2010 Coll. on Air, as amended, and all following acts, executive decrees and regulations of the Government of the Slovak Republic.

The operation method of air pollution sources is governed by valid decisions of the national authorities and the supervisory bodies for air protection issued for JAVYS, a. s., from the source permission, definition of the emission monitoring system, to the determination of the limits of discharged pollutants into the air.

Sources of Air Pollution and Volumes of Discharged Emissions

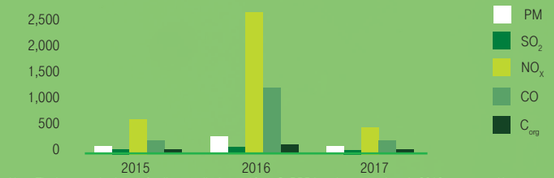
JAVYS, a. s., is the operator of air pollution sources in the categories – large, medium, small sources.

Start-up and reserve boiler room (SuRBR)	large source
LOOS boiler in the SuRBR premises	medium source
Gas infra-red heaters in the building of the Trnava FCC production plant	medium source
Diesel generator in the V1 pumping station	medium source
Diesel generator next to the A1 outdoor substantiation	medium source
Diesel generator in the V1 sub-station (2 pcs)	medium source
Diesel generator at the ISFS	small source
Gas appliances (boilers) in former Trnava FCC production plant	small source
Production of fibre concrete mixture in V1 FCC production plant	small source

Operation of a small air pollution source at Production of fibre concrete mixture was terminated at Trnava FCC production plant by 31 December 2017 and during the first half of the year 2017 it was moved to Jaslovské Bohunice site.

The municipality of Jaslovské Bohunice, as the authority of air protection, issued an approval for JAVYS, a. s., to the use of a small source of air pollution: Production of fibre concrete mixture – relocation of FCC production technology.

Volumes of emissions released from all sources of air pollution in the period of the years 2015 – 2017 (kg)



Note: The increased volume of pollutants discharged from SuRBR into the atmosphere in 2016 was caused by extra supply of heat in steam for SE-EBO (14 May – 20 June 2016) in the time of planned outage of the V2 nuclear power plant according the valid agreement between JAVYS, a. s., and SE, a. s.

Volume of emissions discharged from individual sources in 2017

Source of pollution	Fuel	Operational hours	Volume of pollutant (kg)				
	Natural gas (in thousand Nm^3)	hrs/year	PM	SO_2	NO_x	CO	C_{org}
SuRBR	15.661	17	1.190	0.143	26.185	8.778	1.116
Boiler LOOS	0.202	2	0.015	0.002	0.299	0.121	0.002
Gas infra-red heaters	75.265	1,049	5.720	0.686	111.543	45.046	7.508
Gas appliances (boilers)	11.351	158	0.863	0.104	16.822	6.794	1.132
	Diesel (t)	**hrs/year**	**PM**	**SO_2**	**NO_x**	**CO**	**C_{org}**
DG Caterpillar Olympian	0.664	14.5	0.942	0.013	3.318	0.531	0.047
DG Martin Power MP 1700	2.069	10	2.937	0.041	10.343	1.655	0.228
DG Martin Power MP 400 – 2 pcs	0.504	5	0.716	0.010	2.520	0.403	0.055
DG Caterpillar 3306	1.222	18.8	1.732	0.024	6.100	0.976	0.139
Production of FC	-	-	25.667	-	-	-	-
Total pollutants from all sources of air pollution (kg)			**39.782**	**1.023**	**177.130**	**64.304**	**10.245**

All of the diesel generators mentioned are not permanently in operation, they serve as emergency sources of electrical power.
In 2017, there were 303 fibre-reinforced concrete containers produced in the FCC production plant, i.e. 1,302.2 t fibre-concrete mixture, representing air pollution by solid pollutants in the amount of 0.0257 t.

In order to notify to the National Pollution Register, in 2017, JAVYS, a. s., sent to the Slovak Environmental Inspectorate and to the Slovak Hydrometeorological Institute a notice on the operation of the start-up and reserve boiler room - data on emissions to air and water and on operational waste management for the previous year.

Volumes of pollutants discharged from BRWTC incinerator in the period of 2013 – 2017

Pollutant (kg)	2017	2016	2015	2014	2013
HCl	0.87	1.460	1.740	9.520	0.550
HF	4.26	2.700	2.230	1.510	0.570
Hg+Tl+Cd	0.248	0.265	0.227	0.128	0.069
As+Ni+Cr+Co	1.301	1.232	1.053	0.616	0.372
Pb+Cu+Mn	0.929	1.056	0.903	0.523	0.307
SO_2	38.00	86.670	46.730	150.320	29.360
NO_x	681.71	642.570	456.450	362.370	247.500
CO	71.03	80.770	79.840	64.930	35.730
PM	1.62	1.610	1.380	3.320	4.890
C_{org}	8.67	11.990	12.760	6.760	6.890
Operational hours/year	7,017	6,857	5,659	3,796	3,251

The operation of the BRWTC incinerator is not covered by the Air Act, it is not categorized as a source of air pollution, the state supervision of the incinerator is performed by Nuclear Regulatory Authority of the Slovak Republic.

Equipment Containing Fluorinated Greenhouse Gases

Data on equipment containing fluorinated greenhouse gases indicated in the table below have been reported at the District Office Trnava, the District Office Bratislava and the District Office Levice. They are subject to the terms of operation in accordance with the Act No. 286/2009 Coll. on Fluorinated Greenhouse Gases and the Regulation of the European Parliament and the Council (EC) No. 517/2014 on Fluorinated Greenhouse Gases.

Equipment containing fluorinated greenhouse gases with volume of 5 or more tones equivalent of CO_2 in Jaslovské Bohunice site and in Trnava

Building	Equipment/number of pieces	Filling	F Gas Volume (t equivalent CO_2)
A1 Outdoor Switchrooms	compact substation 110 kV/2 pcs	SF_6	2x2,120.4
A1 Outdoor Switchrooms	measuring current transformer/6 pcs	SF_6	6x91.2
A1 Outdoor Switchrooms	measuring voltage transformer/6 pcs	SF_6	6x100.32
V1 Outdoor Switchrooms	switchboard 6 kV/4 pcs	SF_6	4x118.79
V1 Outdoor Switchrooms	switchboard 6 kV/1 piece	SF_6	163.02
V1 Outdoor Switchrooms	switchboard 6 kV/1 piece	SF_6	105.79
V1 Outdoor Switchrooms	switch ALSTOM AEA 01/1 piece	SF_6	189.24
V1 Outdoor Switchrooms	EAE 10 cased VHC switch room – HYPACT/2 pcs	SF_6	2x818.52
V1 Outdoor Switchrooms	AEA 02 switch Siemens/4 pcs	SF_6	4x173.28
V1 Outdoor Switchrooms	switchboard 6 kV/26 pcs	SF_6	26x25.76
V1 Outdoor Switchrooms	switchboard 6 kV/7 pcs	SF_6	7x58.14
V1 Outdoor Switchrooms	switchboard 6 kV/1 piece	SF_6	53.81
VV1 Outdoor Switchrooms	switchboard 6 kV/5 pcs	SF_6	5 x 31.69
V1 Outdoor Switchrooms	switchboard 6 kV/1 piece	SF_6	41.04
V1 Outdoor Switchrooms	switchboard 6 kV/2 pcs	SF_6	2 x 27.36
V1 Outdoor Switchrooms	switchboard 6 kV/1 piece	SF_6	36.48
V1 Outdoor Switchrooms	switchboard 6 kV/2 pcs	SF_6	2 x 29.64
V1 Outdoor Switchrooms	switchboard 22 kV/1 piece	SF_6	23.26
V1 Outdoor Switchrooms	switchboard 22 kV/1 piece	SF_6	30.55
V1 Outdoor Switchrooms	switch Siemens AEA/5 pcs	SF_6	5 x 57
V1 Pumping Station	switchboard r6-16.05/2 pcs	SF_6	2 x 13.68
V1 Pumping Station	switchboard r6-16.05/2 pcs	SF_6	2 x 25.08
V1 Pumping Station	switchboard r6-16.05/5 pcs	SF_6	5 x 20.52
V1 Pumping Station	switchboard r6-16.05/2 pcs	SF_6	2 x 27.36
V1 Pumping Station	switchboard r6-16.05/2 pcs	SF_6	2 x 15.96
A1 Reactor Building	stable extinguisher LPG-190-00/1 piece	R 227ea	320.71
A1 Reactor Building	stable extinguisher LPG-190-00/1 piece	R 227ea	337.46
A1 Reactor Building	stable extinguisher LPG-190-00/1 piece	R 227ea	303
A1 Reactor Building	stable extinguisher KD 200/1 piece	R 227ea	82.11
A1 Administrative building	stable extinguisher KD 200/1 piece	R 227ea	144.9
A1 Administrative building	stable extinguisher KD 200/1 piece	R 227ea	74.06
A1 Administrative building	stable extinguisher KD 200/1 piece	R 227ea	17.71
A1 Administrative building	stable extinguisher KD 200/1 piece	R 227ea	17.35
A1 Administrative building	stable extinguisher KD 200/1 piece	R 227ea	157.78
Building of el.protections	stable extinguisher KD 200/1 piece	R 227ea	141.36
A1 Steam-generator building	air conditioning unit MITSUBISHI/1 piece	R 410A	7.31
A1 Turbine hall	air conditioning unit PANASONIC/1 piece	R 410A	5.51
Active water pumping station	air conditioning unit DAIKIN/2 pcs	R 410A	2 x 7.73
A1 Administrative building	air conditioning unit MITSUBISHI/2 pcs	R 410A	2 x 48.02
A1 Administrative building	air conditioning unit MITSUBISHI/1 piece	R 410A	54.29
A1 Administrative building	air conditioning unit MITSUBISHI/1 piece	R 410A	45.94
A1 Administrative building	air conditioning unit MITSUBISHI/1 piece	R 410A	48.02
A1 Administrative building	air conditioning unit PANASONIC/1 piece	R 410A	7.1
A1 Administrative building	air conditioning unit PANASONIC/1 piece	R 410A	7.1
A1 Administrative building	air conditioning unit LG/1 piece	R 410A	15.76
VUJE Administrative building	air conditioning unit TOSHIBA/1 piece	R 410A	37.58
V1 SuRBR	air conditioning unit TOSHIBA/1 piece	R 410A	5.01
V1 Substation	air conditioning unit MITSUBISHI/1 piece	R 410A	12.11
V1 Administrative building	split unit LG/4 pcs	R 410A	4 x 15.76
V1 Administrative building	air conditioning unit LG/2 pcs	R 410A	2 x 6.06
V1 Administrative building	air conditioning unit TOSHIBA/1 piece	R 410A	5.85
V1 Archive	cooling unit LENNOX/1 piece	R 410A	56.38
Physical protection building	air conditioning unit TOSHIBA/5 pcs	R 410A	5 x 5.01
BRWTC	air conditioning unit CARRIER/2 pcs	R 407C	2 x 51.45
Cargo lodge at JAVYS, a. s.	air conditioning unit TOSHIBA/1 piece	R 410A	5.01
Lodge at ISFS	air conditioning unit TOSHIBA/1 piece	R 410A	5.01
FCCP Trnava	air conditioning unit TOSHIBA/1 piece	R 410A	5.01

Equipment containing fluorinated greenhouse gases with volume of 5 or more tones equivalent of CO_2 in Bratislava site

Building	Equipment	Filling	F Gas Volume (t equivalent CO_2)
AC Bratislava	1 air conditioning unit TOSHIBA	R 410A	22.97
AC Bratislava	1 cooling unit DAIKIN	R 410A	20.04
AC Bratislava	2 air conditioning units LG	R 410A	2 x 5.22
AC Bratislava	1 cooling unit YORK	R 407C	39.03
AC Bratislava	2 pcs VRV system DAIKIN	R 407C	2 x 19.87
AC Bratislava	1 piece VRV system DAIKIN	R 407C	20.93
AC Bratislava	1 piece VRV system DAIKIN	R 407C	11.18
AC Bratislava	1 piece VRV system DAIKIN	R 407C	11.35

Equipment containing fluorinated greenhouse gases with volume of 5 or more tones equivalent of CO_2 in the Mochovce site (institutional radioactive waste material - IRAW and captured radioactive material - CRAM)

Building	Equipment	Filling	F Gas Volume (t equivalent CO_2)
808	automatic extinguishing system type typu FE-36/2 pcs	R 236fa	2 x 490.5
808	air conditioning unit type MITSHUBISHI	R 407C	10.64
Equipment of IRAW and CRAM	1 air conditioning unit MITSUBISHI	R 410A	49.07

Greenhouse Gas Emissions

In accordance with the Act No. 414/2012 Coll. on Emission Trading, JAVYS a. s. is a mandatory trading scheme participant. In 2017, there were 46 t of greenhouse gases (CO_2) discharged into the atmosphere from the operation. Volume of CO_2 emissions compared to year 2016 (2,607 t) significantly decreased and returned to average annual values of the previous years. In 2017, air pollution sources were operated only in emergency mode (no steady operation).
Report on activity standard of the operation parts as well as Report on greenhouse gas emissions from the operation for the year 2017 was elaborated.

Both reports were verified in accordance with the law by an accredited verifier. The emission report together with the verification report was sent to the District Office Trnava and the Ministry of Environment of the Slovak Republic.

Discharges of Radioactive Substances into the Atmosphere

From nuclear facilities of JAVYS, a. s., there is only small percentage of the guide limits for gaseous and liquid discharges being discharged into the surrounding environment after repeated control measurements.
The objective of the guide limits for discharges is to ensure that effective dose per capita caused by discharges of radioactive substances into the atmosphere and hydrosphere from the nuclear facilities of JAVYS, a. s., Jaslovské Bohunice shall not exceed 32 μSv/year and from the nuclear facility of FP LRAW shall not exceed 10 μSv/year.
Guide limits for radioactive discharges into the atmosphere are stated in limits and conditions for each nuclear facility (RAW PTT, A1 NPP, ISFS, V1 NPP, FP LRAW). These limits have been set up in the decisions of the Public Health Authority of the Slovak Republic and they have been approved by the Nuclear Regulatory Authority of the Slovak Republic.

Gaseous discharges of radioactive aerosols (β, γ) for the year 2017

Nuclear Facility	Discharge activity	Guide Limit	% of Guide Limit
Aerosols VS 46A (MPB)	2,175,581 Bq	6.58×10^8 Bq	0.331
Aerosols VS 46B (BL and OS)	169,110 Bq	1.41×10^8 Bq	0.120
Aerosols VS 808 (BRWTC and OS)	54,993 Bq	1.41×10^8 Bq	0.039
Aerosols VS 840 (ISFS)	80,641 Bq	3.00×10^8 Bq	0.027
Aerosols V1 NPP	31,037,840 Bq	8.00×10^{10} Bq	0.039
Aerosols from FP LRAW	13,600 Bq	8.00×10^7 Bq	0.017

Air mass from the FP LRAW facility is discharged into the stack of SE-EMO (not discharged directly into the environment). Re-filtration of air mass and subsequent discharge into the environment is performed in facilities of SE-EMO, together with the air mass from SE-EMO.
No radioactive substances have been discharged into the atmosphere from the NRWR premises, due to the nature of the repository.

In 2017, discharges from nuclear facilities of JAVYS, a. s., into the atmosphere were well below the guide limits set up by the Public Health Authority of the Slovak republic.

03 WATER MANAGEMENT

In the field of water protection, JAVYS, a. s., complies with the basic legal regulation – the Act of the National Council of the Slovak Republic No. 364/2004 Col., the Water Act, as amended, and all direct and indirect following acts and executive decrees as amended by later regulations.

The values of permitted quantity of discharged wastewater, the concentration and balance limits of pollutants in wastewaters, the place and method of discharges, the amount of collected surface water, etc. are determined by the applicable decisions of the national and supervisory authorities in the field of water protection issued for JAVYS, a. s..

Drinking Water

In the Jaslovské Bohunice site, JAVYS, a. s. uses the drinking water distribution system of Trnavská vodárenská spoločnosť for drinking and sanitary purposes.
The premises in the Mochovce site – NRWR and FP LRAW use water supply from SE-EMO as a source of drinking water.
The premises of the FCC production plant were supplied with drinking water from the public water supply system of Trnavská vodárenská spoločnosť till July 2017. The FCC production plant was moved to the Jaslovské Bohunice site.
Supply of drinking water for the administrative centre in Bratislava is provided from the public water supply system of Bratislavská vodárenská spoločnosť.

Amount of drinking water consumed in the period of 2014 – 2017

Site	Amount of drinking water (m^3)			
	2017	2016	2015	2014
Jaslovské Bohunice	40,218	46,509	50,364	56,640
NRWR	826	642	791	902
FP LRAW	295	257	331	227
FCC production plant	177	785	997	983
Administrative Centre Bratislava	1,060	1,219	1,040	947
Spolu	**42,576**	**49,412**	**53,523**	**59,699**

The total consumption of drinking water in the year 2017 decreased of 6,836 m^3 compared to the previous year (mainly in the site of Jaslovské Bohunice and Bratislava), which represents reduction in the consumption of 13,8 %.

Analysis of drinking water samples

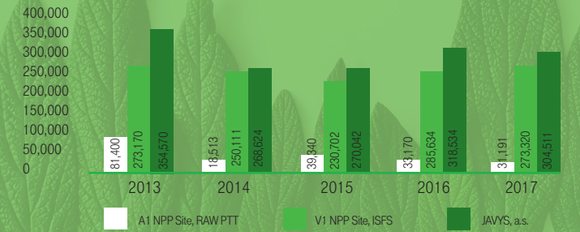
In JAVYS, a. s., the quality of drinking water is controlled in accordance with the Regulation of the Government of the Slovak Republic No. 354/2006 Coll., as amended and the new Decree of the Ministry of Health of the Slovak Republic No. 247/2017 Coll., as amended, laying down the requirements for quality of drinking water, quality control of drinking water, monitoring program and risk management at drinking water supply.
In 2017, there were 9 minimal and 3 full analyses of drinking water carried out in JAVYS, a. s., based on a valid contract. Record on testing was issued for each analysis, while in all cases the tested sample complied with the limit values for the evaluated sample indicators.

Cooling Water

The Site of Jaslovské Bohunice

In the Jaslovské Bohunice site, surface water from Sĺňava reservoir is used as cooling water. SE-EBO is the supplier of this water.
Surface (raw) water of the River Váh is used for cooling the safety and emergency systems in V1 NPP, for cooling the facilities for radioactive waste processing and storage and the facilities for spent nuclear fuel (ISFS).
Consumption of cooling water has had decreasing tendency since 2013.

Consumption of cooling water (the River Váh water) in the period of 2013 – 2017 (m^3)



The Site of FP LRAW Mochovce

Technological facilities of FP LRAW (bitumen lines and thickening evaporator) are connected to the supply of unimportant technical water from SE-EMO distribution system, i.e. to the system of circulation cooling water. Consumption of cooling water from January to December 2017 was at the amount of 13,408 m^3.

Wastewater

The Site of Jaslovské Bohunice

In the site of JAVYS, a. s. in Jaslovské Bohunice there are several kinds of sewage systems in operation:

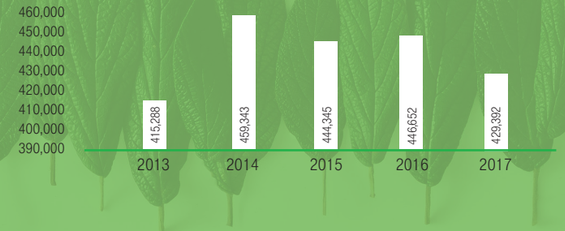
- Rain water sewage system – flows into the recipient Dudváh through the open channel Manivier,
- Sewage system – flows into the sewage treatment facility – BIOCLAR and then into the River Váh through the pipe drainage collector SOCOMAN,
- Industrial sewage system – water contaminated by petroleum substances flow into the central gravitational oil separator, after purification water is led to SE-EBO V2 for treatment of additional cooling water by clarification,
- Special sewage system - flows into collecting tanks of facilities for special cleaning of radioactive water at the given site and following the purification and inspection the wastewater is discharged under control.

Other wastewater from technological facilities for processing and treatment of RAW including low radioactive water is discharged by the final drainage collector SOCOMAN into the recipient Váh.

Balance of discharged wastewater

Wastewater from the Jaslovské Bohunice site is discharged through the pipe drainage collector SOCOMAN and the open canal Manivier in accordance with the applicable decision No. OU-TT-OSŽP2-2013/00026/GI, issued by the District Office in Trnava on 24 October 2013. This authorization is valid until 31 October 2023.
In accordance with the applicable decision, JAVYS, a. s. shall not be obliged to measure quantity and quality of rainfall water discharged from JAVYS a. s. into the recipient Dudváh.
There was no exceeding of the limit values of pollutant indicators in wastewater discharged into the recipient Váh during the reported period.

Amount of discharged wastewater into the recipient Váh in the period of 2013 – 2017 (m^3)



Average concentration of chemical pollution discharged into the recipient Váh

Chemical pollution indicators	Average concentration of discharged pollution 2017	Maximum allowed concentration (decision OU-TT-OSŽP2-2013 /00026/GI)
	mg/l	mg/l
Acidity, alkalinity – pH	8.037	9.00
Biochem. oxygen consumption – BOS_5	2.464	8.00
Chem. oxygen consumption – $CHOC_{Cr}$	9.833	30.00
Insoluble substances – IS	15.000	20.00
Soluble substances – SS	346.556	1,000.00
Ammonia – $N\text{-}NH_4^+$	0.910	4.00
Nitrates – NO_3^-	17.172	50.00
Sulphates – SO_4^{2-}	23.653	150.00
Chlorides – Cl^-	14.998	100.00
Extracted non-polar substances – ENS	0.021	0.35
Total phosphates – P_{total}	0.312	2.00
Iron – Fe	0.116	2.00
Detergents – PAL	0.068	0.50

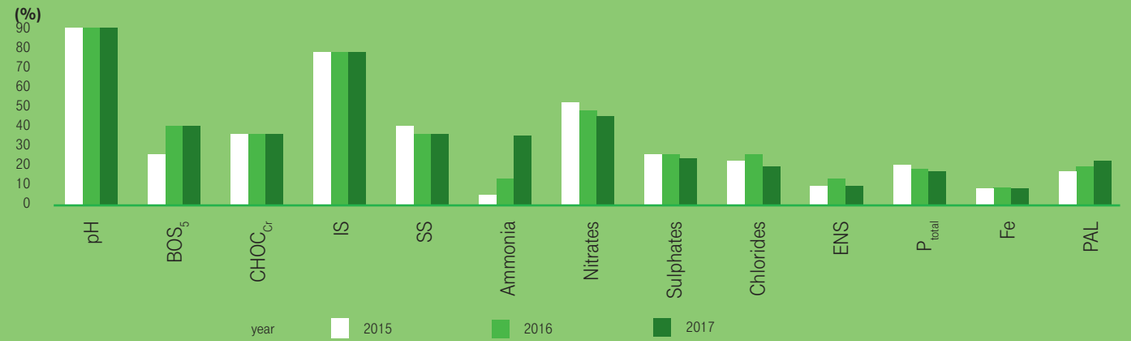
The Site of NRWR Mochovce

In the NRWR site, there is a rain water sewage system which flows into the creek Telinsky potok through the rain water tanks.
In the decision No. OOZPŽ/6573/2011, the Chief Public Health Officer of the Slovak Republic issued permission for JAVYS, a. s., stating also the limits on activity of radionuclides discharged in water from surface runoff from the Mochovce NRWR.
Decision No. 2015/040759 - discharge of water from surface runoff into the surface flow of the creek Telinsky potok, was issued by the District Office Nitra, Section of Environmental Protection.
In 2017, there were 1,816 m^3 of water discharged from NRWR from the surface runoff into the creek Telinsky potok. Sewage water in the amount of 246 m^3 accumulated in a waterproof cesspool at NRWR was removed to the wastewater treatment plant for cleaning.

The Site of FP LRAW Mochovce

Sewage water from FP LRAW is drained into the sewage system of SE-EMO, into the wastewater treatment plant and after purification together with the waters from SE-EMO it is discharged into the environment.
Quantity of rainwater is calculated from the total roof surface of FP LRAW and the average annual rainfall (1.7 mm/day). Rainwater is drained into the rainwater drainage system of SE-EMO, together with rainfall waters from other constructions of SE-EMO. Rainwater is collected in retention tanks and after measurement it is discharged into the environment.
The discharge of sewage water and rainwater is provided by Slovenské elektrárne, a. s.

Compliance with concentration values of wastewater discharged into the recipient Váh in the period of 2015 – 2017



Discharges of Radioactive Substances into the Hydrosphere

Only small percentage of the permitted limits for liquid discharges is being discharged after repeated control measurements from the nuclear facilities of JAVYS, a. s. into the surrounding environment.
The objective of the guide limits for discharges is to ensure that effective dose per capita caused by discharges of radioactive substances into the atmosphere and hydrosphere from the nuclear facilities of JAVYS, a. s., Jaslovské Bohunice shall not exceed 32 μSv/year, from the nuclear facility of FP LRAW shall not exceed 10 μSv/year and from the nuclear facility of NRWR shall not exceed 20 μSv/year.
Guide limits for radioactive discharges into the surface water are stated in limits and conditions for each nuclear facility of JAVYS, a. s. (RAW PTT, A1 NPP, ISFS, V1 NPP, FP LRAW, NRWR - VLLW, IRAW). These limits have been set up in the decisions of the Public Health Authority of the Slovak Republic and they have been approved by the Nuclear Regulatory Authority of the Slovak Republic.
Regulation of the discharged activities in wastewater is carried out by measuring the volume activity of tritium, corrosive and fission products, and quantity of water in the collection tanks for RAW PTT, A1 NPP, ISFS and V1 NPP while water discharge is also checked by continuous monitoring in measurement structures. Low-level water also includes water discharged from implementation of the standard operation of groundwater remediation pumping from the well N-3 (SO 106), for which the permission was issued by the District Office Trnava in accordance with Act No. 364/2004 Coll. on Water.

Discharge of low-level water from the Jaslovské Bohunice site (including remediation pumping from the site of RAW PTT and A1 NPP) into the recipient Váh

2017	Activities of radionuclides in wastewaters of the recipient Váh							
	The site of V1 NPP, ISFS				The site of A1 NPP, RAW PTT			
	CFP (MBq)	tritium (GBq)	% of the guide limit CFP*	% of the guide limit ^3H*	CFP (MBq)	tritium (GBq)	% of the guide limit CFP**	% of the guide limit ^3H**
Total	15.837	117.822	0.132	1.178	18.883	2.924	0.145	0.146

* guide limit for CFP is 13,000 MBq; guide limit for tritium is 2,000 GBq
** guide limit for CFP is 12,000 MBq; guide limit for tritium is 10,000 GBq

The recipient Dudváh – discharge of low-level water

In 2017, there was no low-level radioactive water discharged into the recipient Dudváh.

Active discharges into the hydrosphere from NRWR and FP LRAW

Only water from surface runoff is discharged at NRWR. The limits of indicators for discharged water were not exceeded during the reported period. The measured values (^3H, ^{60}Co, ^{137}Cs, ^{90}Sr, $^{239+240}Pu$) were at the level of the detection limits.
The volume of 1,816 m^3 of water with total activity of 4.941×10^6 Bq was discharged into the hydrosphere, i.e. into the creek Telinský potok.

The table shows percentage evaluation of the total activity of individual radionuclides in 1,816 m^3 of the discharged volume from surface runoff to limits and conditions. The limits for volume activity of radionuclides in discharged water, set up in the decision of the Chief Public Health Officer, were not exceeded in any of the indicators in the reported period.

Data on quality of discharged rain waste water from NRWR

Radionuclide	Discharge Activity (Bq)	Guide Limit (Bq/year)	% of Guide Limit
^3H	4.54×10^6	1.88×10^{10}	0.024
^{137}Cs	3.60×10^4	2.28×10^7	0.158
^{60}Co	1.90×10^4	2.24×10^7	0.085
^{90}Sr	3.39×10^5	2.44×10^8	0.139
$^{239+240}Pu$	1.60×10^4	5.56×10^5	1.429

Two kinds of secondary active liquid waste are produced in FP LRAW. These active media (wastewater, bride condensate) are not discharged into the environment (active discharges), but they are pumped into the system of SE-EMO for further processing.

Data on quality of discharged secondary active wastewater from FP LRAW into SE-EMO

Radionuclide	Waste-water V = 0.0 m^3	Bride Condensate V = 16.7 m^3	Total Activity	Annual limit Bq	% of the limit
Tritium (Bq)	0	3.91×10^8	3.91×10^8	3.0×10^{11}	0.130
Corrosium and fission products (Bq)	0	7.00×10^6	7.00×10^6	3.9×10^9	0.180

Note: Wastewater and bride condensate are purified in SE-EMO, i.e. contribution in discharges into the environment are even lower.

In 2017, JAVYS, a. s. did not exceed the limit for tritium activity in discharged water and discharges of corrosion and fission products in wastewater were under the authorised limits.

Groundwater Monitoring and Protection

The Site of Jaslovské Bohunice

Monitoring and protection of groundwater and soil water in the Jaslovské Bohunice site and its surroundings has been carried out since 1997 in accordance with the approved monitoring program. The long term and regularly monitored radiation situation in the groundwater of the site at RAW PTT and A1 NPP is currently stabilized. The system of continuous remediation pumping has been in operation on the site since 2000.
There have been activities implemented under the project of A1 NPP decommissioning, which have removed the primary sources of contamination of soil and, consequently, contamination of groundwater. Operation of remediation pumping was performed in accordance with the Decision of the Ministry of Environment of the Slovak Republic No. R-AR 05/2013 dated on 2 May 2013 on approval of the final report with risk analysis of the contaminated area.

Evaluation of standard operation of groundwater remediation pumping from the well N-3 in 2017

Remediation Pumping 2017	Drawn CFP Activity	Drawn Guide Limit CFP*	Drawn Activity of Tritium	Drawn Guide Limit ^3H*	Pumped Water Volume (m^3)
	MBq	%	GBq	%	
Total	1.650	0.014	53.870	0.539	174,221

* Values of Drawn Guide Limit have been set up by the decision, guide limit of CFP = 1.2×10^4 MBq, guide limit of ^3H = 1.0×10^4 GBq

Besides monitoring inside the company premises, there have been also monitoring of the surroundings carried out. On the basis of the groundwater monitoring results in the vicinity of the Jaslovské Bohunice site, it is possible to observe significant improvement of the radiation situation (decrease in the level of volume activities of tritium to an insignificant level reaching the level of natural background) in the vicinity of the villages Malženice and Žlkovce.

The Site of NRWR Mochovce

There are 52 monitoring wells (groundwater) in the site and in its vicinity of NRWR, from which samples were taken according to the current schedule for 2017, and then chemical and radiochemical analyses were carried out.
Besides monitoring of groundwater, there was also drainage water monitored at NRWR. Volume activity of individual radionuclides in drainage water in 2017 was below the limit set by the Chief Health Officer of the Slovak Republic in the Decision No. OOZPŽ/6573/2011. Drainage water has been discharged through rain tanks. Its quantity and analyses have been included in discharged waters.

Results of chemical and radiochemical analyses of water in 2017

Measured Quantity	Activity (Bq/l)
^3H	< 5
Total beta activity	< 1
^{137}Cs	< 1.25
^{60}Co	< 0.87
^{90}Sr	< 0.13
^{239}Pu	< 0.01

Results of radiochemical measurements are at the background level and during operation there have not been any negative impacts on the environment in the site of NRWR and in its surroundings.

Inspections and Controls in Water Management

On 5 April 2017, the Slovak Environmental Inspection in Nitra, Department of water inspection, carried out as an operational inspection aimed at assessing the completeness and timeliness of the operational regulation Plan of emergency measures for prevention of surface and groundwater pollution in JAVYS, a. s. in the site of Jaslovské Bohunice. There was no discrepancy between the content of the emergency plan and the reality.

WASTE MANAGEMENT (INACTIVE WASTE)

04

In 2017, JAVYS, a. s., complied with the basic regulation in the field of waste management (inactive waste) – the basic legal regulation - the Act of the National Council of the Slovak Republic No. 79/2015 Coll. on Waste, as amended, and all following acts and executive orders, in the wording of later regulations.

Wastes outside the BIDSF projects

The Site of Jaslovské Bohunice

Waste management is performed through collection, separation and concentration in the premises reserved for these purposes – Waste Collection Site. Wastes that could potentially endanger any of the components of the environment, must meet hygienic and safety requirements is temporarily stored, prior to its final disposal, in the appropriate technologically secured premises in order to avoid its negative impact or threat to life and health of people, property and the environment.
Composition of waste produced directly or indirectly results from the activities related to the business of JAVYS, a. s.
For collection of hazardous waste at the waste producer prior to its further management, JAVYS, a. s., has been granted the consent of the District Office Trnava.

In 2017, there was waste produced in JAVYS, a. s. in categories of other waste (O) and hazardous waste (H) according to the catalogue of waste (Decree of the Ministry of Environment of SR No. 365/2015 Coll.), municipal waste and biodegradable waste.

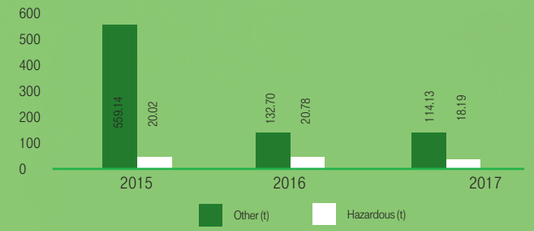
Amounts and types of other waste produced in JAVYS, a.s., in 2017 outside the BIDSF projects

Catalogue number	Waste type	Waste name	Amount(t)	Recovered(t)	Disposed (t)
080318	O	Waste toner cartridge for printers other than in 080317	0.26		✓
150101	O	Paper and paperboard packaging	3.87	✓	
150102	O	Plastic packaging - PET	0.80	✓	
160214	O	Discarded equipment other than those indicated in 160209 – 160213	17.00	✓	
170107	O	Mixtures of concrete, bricks, tiles other than in 170106	10.34		✓
170201	O	Wood	9.76	✓	
170604	O	Insulation materials other than those indicated in 170601-03	23.50		✓
190809	O	Fat and oil blends from oil separators from water containing edible oils and fats	6.00		✓
200306	O	Waste from sewage cleaning	42.60		✓
Total Amount			**114.13**	**31.43**	**82.70**
Total Amount (%)			**100 %**	**27.54 %**	**72.46 %**

Amounts and types of hazardous waste produced in JAVYS, a.s., in 2017 outside the BIDSF projects

Catalogue number	Waste type	Waste name	Amount (t)	Recovered (t)	Disposed (t)
090104	H	Fixer solutions	0.48		✓
130502	H	Sludge from the oil separators from water	2.90	✓	
130502	H	Sludge from the oil separators	0.70		✓
130507	H	Water containing oil from oil separators from water	1.00	✓	
130802	H	Other emulsions	0.14	✓	
150202	H	Absorbents, filter materials including oil filters, cleaning cloths contaminated by DS	0.34	✓	
160213	H	Discarded equipment containing NL other than those indicated in 160209 - 160212	0.24	✓	
160506	H	Laboratory chemicals consisting of DS, containing DS	0.27		✓
160508	H	Discarded organic chemicals consisting of DS, containing DS	0.40		✓
160601	H	Lead-acid batteries	2.36	✓	
170409	H	Metal waste contaminated by DS	0.10	✓	
170410	H	Cables containing oil, coal tar and other DS	1.32	✓	
190304	H	Partially stabilized waste marked as hazardous except 190308	0.42		✓
191206	H	Wood containing DS	7.20	✓	
200121	H	Fluorescent lamps and other waste containing mercury	0.32	✓	
Total Amount			**18.19**	**15.92**	**2.27**
Total Amount (%)			**100 %**	**87.53 %**	**12.47 %**

Amounts of other waste and hazardous waste in JAVYS (outside the BIDSF projects) produced in the period of 2015 – 2017 (t)



Amounts of municipal waste and biodegradable waste produced in 2017

Catalogue Number	Waste type	Waste name	Amount (t)	Recovered (t)	Disposed (t)
200301	O	Mixed municipal waste	32.44		✓
200201	O	Biodegradable waste	10.16	✓	
Celkové množstvo			**42.60**	**10.16**	**32.44**
Celkové množstvo (%)			**100 %**	**24 %**	**76 %**

Waste recovery and disposal are provided by companies with appropriate permits and authorizations for the treatment of individual types of waste.
Disposal of municipal waste is carried out through municipalities in relevant localities (Trnava, Bratislava, Jaslovské Bohunice) in accordance with generally binding regulations of municipalities.

The Site of Mochovce

In the site of Mochovce, mixed municipal waste was produced at NRWR and FP LRAW in the total amount of 1.631 t. Other waste was produced at the amount of 0.16 t and hazardous waste at the amount of 0.294 t.
Collection and disposal of waste from the premises in Mochovce is provided through a service provider, i.e. SE-EMO.

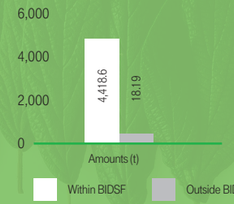
Wastes within the BIDSF projects

Jadrová a vyraďovacia spoločnosť, a.s., as part of the V1 NPP decommissioning project in 2017, started the implementation of the BIDSF D3.1B Project "Dismantling and Demolition of V1 NPP Cooling Towers". The project is implemented within the 2nd stage of decommissioning of V1 NPP, which fulfils the decommissioning strategy of V1 NPP Jaslovské Bohunice on the basis of the Decision of the Government of the SR on the final shutdown of V1 NPP Bohunice from September 1999. As part of the implementation of the project, there was a significant production of other and hazardous waste, which was recovered and disposed under the contractual terms of the project.

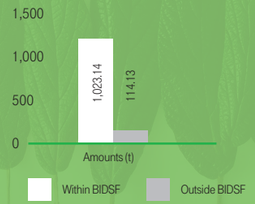
Amounts and types of other waste and hazardous waste produced in JAVYS, a.s., in 2017 within the BIDSF D3.1B Project

Catalogue Number	Waste Type	Waste Name	Amount (t)	Recovered (t)	Disposed (t)
170201	O	Wood – Project BIDSF D3.1B	159.96	✓	
170203	O	Plastic – Project BIDSF D3.1B	863.18		✓
Total Amount of Other Waste			**1,023.14**	**159.96**	**863.18**
Total Amount of Other Waste (%)			**100 %**	**15.63%**	**84.37 %**
170605	H	Construction materials containing asbestos – project D3.1B	4,418.60		✓
Total Amount of Hazardous Waste			**4,418.60**	**0**	**4,418.60**
Total Amount of Hazardous Waste (%)			**100 %**	**0 %**	**100 %**

Hazardous Waste 2017



Other Waste 2017



05 SERIOUS INDUSTRIAL ACCIDENTS

In the field of prevention of serious industrial accidents, JAVYS, a. s. complies with the basic legal regulation – the Act of the National Council of the Slovak Republic No. 128/2015 Coll. on Prevention of Major Industrial Accidents and on modifications and amendments of certain acts as well as all following acts and executive orders, in the wording of later amendments.

Categorisation of the Company

Within the meaning of the Act No. 128/2015 Coll. based on the quantity and characteristics of dangerous substances present in the Jaslovské Bohunice site, Jadrová a vyraďovacia spoločnosť, a. s. is not included in categories "A" or "B".
Nevertheless, the company is obliged to continue in regular monitoring of quantity, fire characteristics and type of dangerous substances present in the premises of the company and in case it is necessary to change the classification the company is obliged to send a new notification to the District Office in the seat of the region.
The application Management of chemical substances (MCHS) is used to monitor treatment of dangerous chemical substances. The application includes classification of all chemical substances and mixtures purchased and used in the company and also those brought into the premises of JAVYS, a. s. by contractors and tenants. All chemical substances and mixtures are categorized according to the Chemical Act, the Act on Water and the Act on Prevention of Major Industrial Accidents.

06 ENVIRONMENTAL IMPACT ASSESSMENT

In the field of environmental impact assessment, JAVYS, a. s. complies with the basic legal regulation – the Act of the National Council of the Slovak Republic No. 24/2006 on Environmental Impact Assessment and on amendments to certain acts, as amended.

Environmental Impact Assessment Procedures

In 2017, examination procedures were performed for activities carried out by the BIDSF project D4.1 Modification of the power plant and installation of new equipment based on notifications of proposed activity change developed for individual partial implementation projects.

For the notification of the change for DZM 5294/2017 Construction of the ISFS pumping station and the installation of the pipeline routes for pumping of regeneration and decontamination solutions in ISFS there was a decision issued in an examination procedure by which the Ministry of Environment of the SR decided that the change of the proposed activity would not be assessed pursuant to Act no. 24/2006 Coll.

By the end of 2017 the examination procedure related to the notifications on changes for partial projects:
- DZM 5291/2017 Modification of chilled water and demineralised water supply system for ISFS,
- DZM 5295/2017 Dismantling of pipeline channels APK-M and SPK-M (including dismantling of pipeline routs),
- DZM 5293/2017 Modification contaminated water removal from ISFS.

With regard to the requirement for addition of the fixed RAW pre-treatment facility to the building of the solid waste storage, a notice of change was drawn up, for which the examination procedure was interrupted by requesting additional information to clarify the comments received for the notification. By the end of 2017, the examination procedure had not been completed yet.

07 ENVIRONMENTAL MANAGEMENT SYSTEM

Activities Performed at Authorization

Implementation and performance of activities, which have been assessed in accordance with the Activities Performed at Authorization on Environmental Impact Assessment is possible only under the condition of proving the conformity of the activity implementation with the final standpoint of the Ministry of Environment of the SR from the assessment process or the standpoint issued in the examination procedure.

In 2017, there was a written evaluation elaborated on fulfilling the conditions indicated in the final standpoint for the authorisation procedure:

- Integral RAW storage facility (BIDSF C8) - evaluation of conditions of the final standpoint of the Ministry of Environment of the SR as a basis to issue a bidding standpoint of the Ministry of Environment of the SR related to issue of the permission for nuclear facility operation and management of radioactive waste in the nuclear facility of integral RAW storage facility and the permission to use the building facility.
- Disposal facility for very low-level waste Mochovce (BIDSF C9.4) – evaluation of conditions of the final standpoint of the Ministry of Environment of the SR as a basis to issue a bidding standpoint of the Ministry of Environment of the SR related to issue of permission to use the building.
- Metallic RAW Melting Facility (BIDSF C7-A4) – evaluation of conditions of the final standpoint of the Ministry of Environment of the SR as a basis to issue a bidding standpoint of the Ministry of Environment of the SR related to issue of building permission.
- Dismantling and Demolition of Cooling Towers (BIDSF D3.1B) – evaluation of conditions of the final standpoint of the Ministry of Environment of the SR as a basis to issue a bidding standpoint of the Ministry of Environment of the SR related to issue of permission for removal.
- Auxiliary Buildings System Removal – 1st Stage (BIDSF D4.4A) – evaluation of conditions of the final standpoint of the Ministry of Environment of the SR as a basis to issue a bidding standpoint of the Ministry of Environment of the SR related to issue of building permission.

In all binding standpoints the Ministry of Environment of the Slovak Republic confirmed conformity of authorisation procedures with the Act No. 24/2006 Coll. and decisions issued in accordance with this act.
In relation to performance of assessed activities the company is obliged to carry out post-project analysis, while its procedure and monitoring plans have been elaborated as a part of the process documentation for the site of Jaslovské Bohunice and Mochovce.

Based on the results of the post-project analysis and evaluation of fulfilling the conditions of the binding standpoints of the Ministry of Environment of the Slovak Republic, it can be stated that JAVYS, a. s., performs all the assessed activities in accordance with the Act on Environmental Impact Assessment and decisions issued in accordance with this act.

Maintaining the certified environmental management system in accordance with the standard ISO 14001:2015 Environmental Management Systems, JAVYS, a. s. performed all activities with regard to environmental protection in 2017.

In the context of procedural approach, environmental protection has been regularly inspected and verified by internal audits of IMS at which application of the requirements of the environmental management system has been also examined.

In 2017, there was an audit of IMS focused on examination of the environmental protection requirements in the facilities of NRWR, very low-level waste and in the facilities for management of IRAW a CRAM in Mochovce. Audit was performed on 17 – 18 May 2017. There were no discrepancies identified during the audit performance.

Abbreviations

AC	Administrative Centre
As	Arsenic
A1 NPP	A1 Nuclear Power Plant
Bq	Becquerel
BIDSF	Bohunice International Decommissioning Support Fund (V1 NPP)
BL	Bitumen Line
BRWTC	Bohunice Radioactive Waste Treatment Centre
C_{org}	Organic Carbon
Cd	Cadmium
CFP	Corrosion and Fission Products
CO	Carbon Monoxide
Co	Cobalt
Cr	Chrome
CRAM	Captured Radioactive Material
Cs	Caesium
Cu	Cooper
DG	Diesel Generator
DS	Dangerous Substance
EIA	Environmental Impact Assessment
EU	European Union
FCC	Fibre Concrete Container
FCCP	Fibre Concrete Container Production
FP LRAW	Final Processing of Liquid Radioactive Waste
GBq	Gigabequerel
H	Hazardous (Waste)
^3H	Tritium
HCl	Hydrogen Chloride
HF	Hydrogen Fluoride
Hg	Mercury
IMS	Integrated Management System
IRAW	Institutional Radioactive Waste
ISFS	Interim Spent Fuel Storage
JAVYS, a. s.	Jadrová a vyraďovacia spoločnosť, a. s.
MBq	Megabequerel
MCHS	Management of chemical substances
Mn	Manganese
MPB	Main Production Building
Ni	Nickel
NO_x	Oxides of Nitrogen
NRWR	National Radioactive Waste Repository
O	Other (Waste)
OS	Outdoor Structures
Pb	Lead
PM	Particular Matter
P_{total}	Total Phosphorus
Pu	Plutonium
RAW	Radioactive Waste
RAW PTT	Radioactive Waste Processing and Treatment Technologies
SAP	Source of Air Pollution
SE-EBO	Slovenské elektrárne, a. s., Bohunice Nuclear Power Plant
SE-EMO	Slovenské elektrárne, a. s., Mochovce Nuclear Power Plant
SF_6	Sulphur Hexafluoride
SNF	Spent Nuclear Fuel
SO_2	Sulphur Dioxide
Sr	Strontium
SR	The Slovak Republic
SuRBR	Start-up and Reserve Boiler Room
Tl	Tellurium
VLVW	Very Low-Level Radioactive Waste
VS	Ventilation Stack
V1 NPP	V1 Nuclear Power Plant

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